

Review worksheet (similar to test)

Tuesday, January 14, 2014
7:54 AM

Riverside Secondary

Foundations 11

Unit 6: Test A

/31

Name: _____

Date: _____ Block: _____

Chapter 7 (Unit 6) REVIEW: Quadratic Functions & Equations

General Form: $y = ax^2 + bx + c$

Vertex Form: $y = a(x - p)^2 + q$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

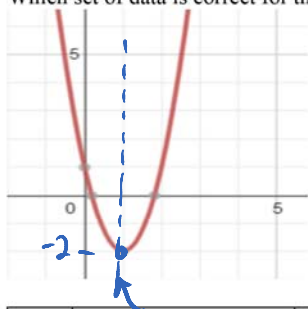
Factored Form: $y = a(x - r)(x - s)$

Axis of Symmetry: $x = (r + s)/2$

Multiple Choice

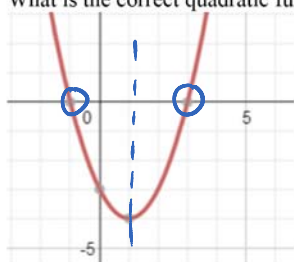
Identify the choice that best completes the statement or answers the question. (1 point each)

1. Which set of data is correct for this graph?



	Axis of Symmetry	Vertex	Domain	Range
A.	$x = 1$	$(-2, 1)$	$x \in \mathbb{R}$	$y \in \mathbb{R}$
<input checked="" type="radio"/> B.	$x = 1$	$(1, -2)$	$x \in \mathbb{R}$ ✓	$y \geq -2$ ✓
<input checked="" type="radio"/> C.	$x = -2$	$(-2, 1)$	$-2 \leq x \leq 1$	$y \geq -2$
<input checked="" type="radio"/> D.	$x = -2$	$(1, -2)$	$0.2 \leq x \leq 1.8$	$y \in \mathbb{R}$

2. What is the correct quadratic function for this parabola?



-1, 3

①
 $y = (x - (-1))(x - 3)$
 $(x + 1)(x - 3)$

A. $f(x) = (x - 1)(x - 3)$

B. $f(x) = (x + 3)(x - 1)$

☒ C. $f(x) = (x - 3)(x + 1)$

D. $f(x) = (x + 1)(x + 3)$

3. Solve $w^2 - 8w + 12 = 0$ by factoring.

A. $w = -8, w = -1$

B. $w = 6, w = 2$

C. $w = 1, w = -12$

D. $w = -6, w = -2$

$$w^2 - 8w + 12 = 0$$

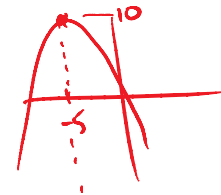
$$(w-2)(w-6) = 0$$

$$w-2=0 \text{ or } w-6=0$$

$$w=2 \text{ or } w=6$$

4. Which set of data is correct for the quadratic relation $f(x) = -2(x+5)^2 + 10$?

	Direction parabola opens	Vertex	Axis of Symmetry
A.	downward	$(-5, 10)$	$x = -5$
B.	downward	$(10, -5)$	$x = 10$
C.	upward	$(5, -10)$	$x = -5$
D.	upward	$(-10, 5)$	$x = 10$



Short Answer

5. (2 points)

Complete the table of values, then graph $y = x^2 - 1x - 2$.

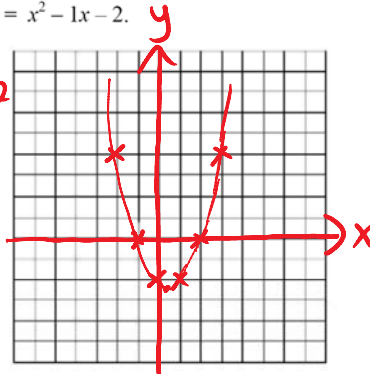
X	Y
-2	4
-1	0
0	-2
1	-2
2	0

$$y = (-2)^2 - 1(-2) - 2$$

$$= 4 + 2 - 2$$

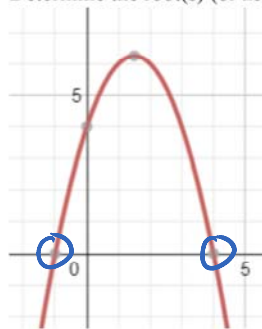
$$= 6 - 2$$

← turning pt



6. (1 point)

Determine the root(s) (or zero(s)) of the corresponding quadratic equation for the graph.



$$-1, 4 \checkmark$$

7. (4 points)

Fill in the table for the quadratic function $f(x) = 2(x-3)(x+2)$.

Zeros	3, -2
Axis of symmetry equation	$x = 0.5$
Vertex	$(0.5, -12.5)$
Y-intercept	-12

$$y = 2(0-3)(0+2)$$

$$= 2(-3)(2) = -12$$

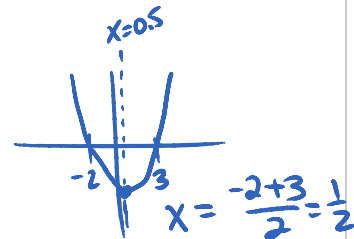
$$y = a(x-r)(x-s)$$

$$y = 2(x-3)(x+2)$$

$$y = 2(0.5-3)(0.5+2)$$

$$= 2(-2.5)(2.5)$$

$$= -12.5$$



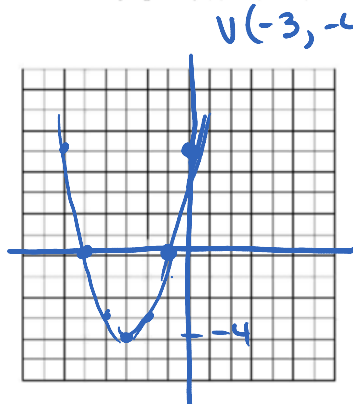
8. (3 points) Solve $10x^2 + x - 2$ by factoring. Show that you have the correct answers.

$10x^2 + x - 2 = 0$
 $10x^2 + 5x - 4x - 2 = 0$
 $5x(2x+1) - 2(2x+1) = 0$
 $(2x+1)(5x-2) = 0$
 so: $2x+1=0$ or $5x-2=0$
 $x = -\frac{1}{2}$ or $x = \frac{2}{5}$ → check
 check $10x^2 + x = 2$
 $10(-\frac{1}{2})^2 + (-\frac{1}{2}) \stackrel{?}{=} 2$
 $10(\frac{1}{4}) - \frac{1}{2} \stackrel{?}{=} 2$
 $2.5 - 0.5 \stackrel{?}{=} 2$ ✓
 $10(\frac{2}{5})^2 + \frac{2}{5} \stackrel{?}{=} 2$
 $10(\frac{4}{25}) + \frac{2}{5} \stackrel{?}{=} 2$
 $\frac{8}{5} + \frac{2}{5} \stackrel{?}{=} 2$
 $\frac{10}{5} \stackrel{?}{=} 2$ ✓

9. (2 points) The graph of a quadratic function has x-intercepts 6 and -1. Write a quadratic equation that has these roots. (Show all work. There are many possibilities. ☺)

$y = a(x-r)(x-s)$
 $y = \#(x-6)(x+1)$
 ↑
 can be any #

10. (3 points) Sketch the graph of $f(x) = (x+3)^2 - 4$, then state the domain and range of the function.



M.O.D. 1, 3, 5
 $a \cdot 1 = 1 \rightarrow$ over 1 up 1 from vertex
 $a \cdot 3 = 3 \rightarrow$ over 1 up 3 from last pt
 $a \cdot 5 = 5 \rightarrow$ over 1 up 5 from last pt

Domain: $x \in \mathbb{R}$

Range: $y \geq -4$

11. (3 points) Determine the equation of a parabola with vertex (3, 4) and point (-4, 5).

$y = a(x-p)^2 + q$
 $y = a(x-3)^2 + 4$
 $5 = a(-4-3)^2 + 4$
 $5 = 49a + 4$
 $1 = 49a$
 $a = \frac{1}{49}$

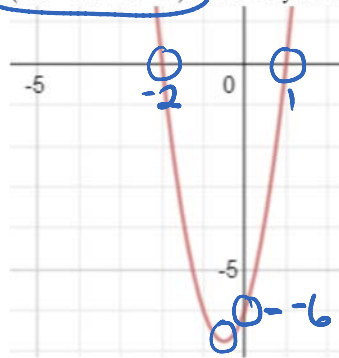
$y = \frac{1}{49}(x-3)^2 + 4$

Problems

12. (3 points) Determine the equation for this quadratic function. Write the equation in General Form ($Ax^2 + Bx + C = 0$). Show all your steps.

$y = a(x-r)(x-s)$ | $y = 3(x^2 - x + 2x - 2)$

Determine the equation for this quadratic function. Write the equation in General Form ($Ax^2 + Bx + C = 0$). Show all your steps.



$$\begin{aligned} y &= a(x-r)(x-s) \\ y &= a(x-2)(x-1) \\ y &= a(x+2)(x-1) \\ -6 &= a(0+2)(0-1) \\ -6 &= -2a \\ 3 &= a \\ \therefore y &= 3(x+2)(x-1) \end{aligned}$$

$$\begin{aligned} y &= 3(x^2 - x + 2x - 2) \\ 0 &= 3x^2 + 3x - 6 \end{aligned}$$

13. (4 points) a b c

a) Solve $2x^2 - 5x + 2 = 0$ using the quadratic formula.

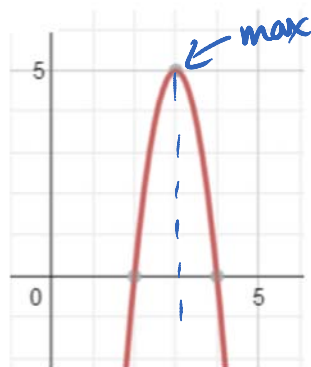
$$\begin{aligned} x &= \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \\ &= \frac{-(-5) \pm \sqrt{(-5)^2 - 4(2)(2)}}{2(2)} \\ &= \frac{5 \pm \sqrt{25 - 16}}{4} \\ &= \frac{5 \pm 3}{4} \rightarrow \frac{5+3}{4} = 2 \text{ or } \frac{5-3}{4} = \frac{1}{2} \end{aligned}$$

b) Solve the equation by factoring.

$$\begin{aligned} 2x^2 - 5x + 2 &= 0 & -5 \mid 4 &\rightarrow -4, -1 \\ 2x^2 - 4x - x + 2 &= 0 \\ 2x(x-2) - 1(x-2) &= 0 \\ (x-2)(2x-1) &= 0 \\ x-2=0 &\text{ or } 2x-1=0 \\ x=2 &\text{ or } x=\frac{1}{2} \end{aligned}$$

14. (2 marks)

Tell me everything you know about this graph:



vertex (3, 5)
zeros 2 and 4
axis of sym $x = 3 = \frac{2+4}{2} = \frac{6}{2} = 3$
opens down: $a < 0$
Domain: $x \in \mathbb{R}$
Range: $y \leq 5$
y-int: ?